

## **AMENDMENTS TO THE ABSTRACT**

Please add the following abstract to the end of the application:

### **ABSTRACT**

An optical transmission system includes an optical source such as a laser having an optical output, this optical output being modulated such that it has periods of operation having a first set of characteristics interspersed with periods of operation having a second set of characteristics. The output is then split into at least two signals, and one of the signals delayed with respect to the other signal before the two are mixed, such that a portion of the modulated optical output having the first set of characteristics in one of the signals corresponds with a portion of the modulated optical output having the second set of characteristics of another of the signals. This allows a single optical source to provide to a receiver a local oscillator signal simultaneously with a data carrying signal. The system is particularly suitable for lidar applications, including gas sensing, but also has utility in data communications systems.